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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,060	07/09/2003	Harris A. Reynolds JR.	09432/246002	9532

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EXAMINER

AFTERGUT, JEFF H

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 04/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,060

Applicant(s)

REYNOLDS ET AL.

Examiner

Jeff H. Aftergut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11,13-18 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11,13-18 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 11, 13-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Derwent Abstract 1973-11210U of DD 94480 (newly cited), Japanese Patent 3-260413 and Yates et al (US Patent 4,171,626).

The admitted prior art suggested that it was known at the time the invention was made to form a wound fiber reinforced plastic tubing by a process which included provision of a inner impermeable plastic liner (which was typically formed from thermoplastic) and the winding of a plurality of layers of fiber impregnated with resin about the liner. The fibers which are wound in a helical pattern over the liner are formed from a hybrid blend of half by volume glass and half by volume carbon fibers in order to provide the desired flexibility and stiffness needed for the tubing. The admitted prior art failed to teach or suggest that this tubing was provided the tubing with an interior layer of glass fiber layer wherein the interior layer was formed only of the glass fibers and then one applied the additional layers of the hybrid material (glass and carbon) onto the same. It should be noted that the wound tubing of the prior art was known to have been a substitute for steel tubing.

Derwent abstract '210U clearly described that it was known in the art of manufacturing a tubing that the liner provided in such a wound assembly was utilized at least in part as an impermeable liner in order to provide corrosion resistance when the

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tubing was utilized for the transport of aggressive liquids and gaseous media. The reference suggested that onto this liner one skilled in the art would have applied resin impregnated fibers in order to form a reinforced pipe in much the same manner that the admitted prior art applied the resin impregnated glass and carbon hybrid layer.

Japanese Patent '413 suggested that it was known at the time the invention was made to provide an inner and exterior layer of glass fibers. The reference suggested that onto the interior layer of glass fibers one would have wound a hybrid layer of two or more kinds of reinforcing fibers. The reference suggested that the hybrid layers were applied at a helical angle of 10 to 45 degrees in both directions. The reference suggested that such processing allowed for the manufacture of a drive shaft made from fiber reinforced plastic that has sufficient strength and high modulus of elasticity in the axial direction. Additionally by providing the innermost layer as a glass fiber layer, the reference to Japanese Patent '413 suggested that the drive shaft was protected against deterioration due to electrolytic corrosion. Clearly, when making a tubing from fiber reinforced plastic material which included hybrid layers of different fiber materials, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate an inner layer of wound glass fibers in order to provide protection against corrosion as suggested by Japanese Patent 3-260413 in the process of making a hybrid tube which included winding a hybrid layer of different fibers about the tube as suggested by the applicant's admitted prior art wherein the fibers were applied to a liner which was used to provide corrosion protection as suggested by the reference to Derwent Abstract 1973-11210U of DD 94480.

While it is believed that one skilled in the art would have understood that the techniques of Japanese patent '413 would have been useful in the admitted prior art, to further evidence that the drive shafts of Japanese Patent '413 would have been relevant to the tubing of the admitted prior art, the reference to Yates is cited. Yates suggested that fiber reinforced plastic shafts which were formed into drive shafts would have been a suitable replacement for known steel shafts in the prior art, see column 1, line 67- column 2, line 4. It should be noted that the applicant's admitted prior art expressly stated that the composite tubes were replacements for steel tubes. Furthermore, while one might question as to whether the layer 4 of Japanese Patent '413 was formed from a single layer or multiple layers which were wound in a plus/minus 10 to plus/minus 45 degree angle, the reference to Yates leaves little doubt that such a winding arrangement was in fact the winding of plural layers of material. More specifically, The use of both + and – direction fiber layers within the layer 4 for the drive shaft is additionally supported by Yates et al who at column 4, lines 51-61 defined the term "layer" and stated that "The term layer encompasses an alignment wherein the fibrous reinforcement is disposed therein at both plus and minus a given angle which optionally can be built-up in multiple passes." Clearly, Japanese Patent '413 suggested several layers (two) within layer 4 wherein the layers were disposed at opposite angles to each other as one went from one pass to another during the winding of the layer 4. As the reference to Japanese Patent '413 was manufacturing a drive shaft, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the inner layer of glass fibers on the wound product as suggested by Japanese Patent

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03-260413 when making a drive shaft which was a substitute for a steel shaft as suggested by Yates in the process of making a substitute tubing for a steel shaft of the admitted prior art wherein one skilled in the art would have understood that the provision of the glass layer directly upon the liner would have provided an additional level of corrosion protection when the pipe was used to transport aggressive liquids or gaseous media as suggested by Derwent Abstract 1973-11210U of DD 94480.

With regard to claim 13, note that the admitted prior art suggested that those skilled in the art would have employed a plastic tubing of thermoplastic for the liner. Regarding claim 14, note that Japanese Patent '413 suggested that the fiber material for the interior was a glass fiber layer. Regarding claim 15, note that the reference to Japanese Patent '413 suggested that the inner layer was a glass fiber layer. Regarding claim 16, note that the admitted prior art suggested that the hybrid layer typically would have included 50% by volume of glass and carbon fibers. Regarding claim 17, note that the resin employed in the admitted prior art was a thermosetting resin which was cured via the application of heat. Regarding claim 21, note that the admitted prior art suggested that the winding operation would have involved the application of resin to the fibers prior to the winding operation. Such is taken as conventional as a wet winding operation or as an operation which included winding preimpregnated filaments upon the mandrel as such it would have been within the purview of the ordinary artisan to utilize such conventional operations in the processing of making the tubing.

Response to Arguments

3. Applicant's arguments with respect to claims 11, 13-18 and 21 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argues that there is no reason to include the corrosion protection on the wound liner as the reference to Japanese Patent '413 failed to wind upon a liner. The admitted prior art did not envision the use of the glass fiber layer adjacent the liner. The applicant argues that the innermost glass fiber layer in the '413 Patent is used for deterioration prevention from electrolytic corrosion within the inner diameter of the shaft and that if the liner of the admitted prior art was further included inside the already innermost glass fiber layer of the '413 patent the glass fiber layer would not be able to protect the drive shaft from electrolytic corrosion. The applicant argues that there is therefore no motivation to include the liner of the admitted prior art in the drive shaft of the '413 Patent. The applicant is advised, however, that this is not the modification which is being made. The modification being made is the inclusion of the glass fiber layer on the interior and exterior of the hybrid layer of the admitted prior art pipe. As one skilled in the art would have incorporated a liner in the admitted prior art wherein the hybrid materials were wound upon the same, it would have been obvious to wind the glass layer of the '413 patent adjacent the liner between the liner and the hybrid layer as the glass fiber layer provided corrosion protection for the hybrid layers of the pipe as evidenced by the '413 Patent. The newly cited reference to the Derwent Abstract evidenced that those skilled in the art would have incorporated the liner for corrosion protection. In order to provide an added level of corrosion protection in case of liner

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failure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the glass fiber layer adjacent the bladder as evidenced by Japanese Patent '413.

It should be noted that hindsight has not been used in making the rejection as the prior art as established above provided the motivation as to why one skilled in the art would have performed the claimed operation. As such, when there is motivation it is not seen how "hindsight" can be made as a consideration.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference to Quigley et al suggested the winding of an interior glass layer, a hybrid interior layer and an exterior layer of glass in a hollow shaft.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:15-345 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeff M. Aftergut
Primary Examiner
Art Unit 1733

JHA
April 20, 2006